

REMARKS

Applicants have amended their claims in order to further clarify the definition of the present invention. Specifically, the independent claims being considered on the merits in the above-identified application are being amended to recite that the first photomask or IP mask includes at least one having an alignment mark made of organic film having a light-shielding property or a light-reducing property to exposure light. While not to be limiting, and while being illustrative of the present invention, note, for example, Fig. 2 and the description in connection therewith from page 21, line 24 to page 22, line 26, of Applicants' specification.

Moreover, Applicants are adding new claims 33-35 to the application. Claims 33-35, dependent respectively on claims 17, 22 and 28, recite that all of the first photomasks or IP masks have an alignment mark made of organic film having a light-shielding property or a light-reducing property to exposure light.

In addition, Applicants are canceling the non-elected claims, claims 1-16, without prejudice or disclaimer, and in particular without prejudice to the filing of a Divisional application directed to the subject matter thereof.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the prior art applied by the Examiner in rejecting claims in the Office Action mailed December 31, 2003, that is, the teachings of U.S. Patent No. 6,653,025 to Nishi, under the provisions of 35 USC § 102 and 35 USC §103.

It is respectfully submitted that this reference as applied by the Examiner would have neither taught nor would have suggested such a method of manufacturing a

semiconductor integrated circuit device as in the present claims, including, inter alia, use of the first photomasks or IP masks as in the present claims, including, inter alia, wherein these first photomasks or IP masks include at least one having an alignment mark made of organic film having a light-shielding property or a light-reducing property to exposure light (see claims 17, 22, 27 and 30); in particular, wherein all of the first photomasks or IP masks have an alignment mark made of organic film having a light-shielding property or a light-reducing property to exposure light (see claims 33-35).

Furthermore, it is respectfully submitted that the teachings of the applied reference would have neither disclosed nor would have suggested such method as discussed previously, having features as described previously in connection with the independent claims 17, 22, 27 and 30, and further including (but not limited to) wherein a metal pattern having a light-shielding property to exposure light is arranged in an integrated circuit pattern region of the second photomask (or product mask), as in claims 18, 23, 28 and 31; or wherein an organic film pattern having a light-shielding property or a light-reducing property to exposure light is arranged in the integrated circuit pattern region of the second photomask or the product mask (see claims 19, 24, 29 and 32); or wherein both a metal pattern having a light-shielding property, and an organic film pattern having a light-shielding property or a light-reducing property, to exposure light, are arranged in an integrated circuit pattern region of the second photomask or product mask (note claims 20 and 25); and/or wherein the method includes the further step of removing the organic film pattern of the second photomask or product mask (note claims 21 and 26).

As presently claimed in the above-identified application, the present invention relates to a technique for manufacturing a semiconductor integrated circuit device, using a photomask, e.g., in a photolithographic technique.

With increased integration of patterns such as elements and circuit wiring in integrated circuit devices, increase in the mask cost, and time of mask production, have become problems. As described in the paragraph bridging pages 2 and 3 of Applicants' specification, various techniques for solving problems in connection with mask manufacture and use thereof have been proposed. For example, as one technique a mask serving as a master (master mask) having high writing accuracy in dimensions is manufactured, and patterns of the master mask are transferred onto a daughter mask using a reduced projection exposure apparatus, with the pattern being transferred onto, e.g., a wafer using the daughter mask. In preparation of the master mask, a metal film such of chromium has been used as a light-shielding layer of the pattern.

However, in this proposed technique for forming a master mask, using a metal film, the present inventors have found various problems. For example, adequate consideration is not given to manufacturing a mask efficiently and in a short time. Furthermore, appropriate measures have not been taken to further reduce mask cost. Note the paragraph bridging pages 3 and 4, and the paragraph bridging pages 4 and 5, of Applicants' specification.

Against this background, Applicants provide a method, including preparation of a first photomask, wherein manufacturing time of the mask is reduced, while mask cost is also reduced. Specifically, Applicants have found that by forming the first photomasks

(IP masks), including an alignment mark thereof, of organic film having a light-shielding property or a light-reducing property to exposure light, the masks can be more easily formed, reducing manufacturing time of the mask and a resulting semiconductor integrated circuit device, and also reducing cost of the mask and semiconductor integrated circuit device formed using such mask.

That is, according to the present invention, not only is the integrated circuit pattern of the first photomask (IP mask) formed of the organic film having a light-shielding property or light-reducing property to exposure light, but also the alignment mark of this mask is formed of the organic film having the light-shielding property or light-reducing property to exposure light (in particular, the integrated circuit pattern and the alignment mark of all of a plurality of IP masks are formed of the organic film having the light-shielding property or light-reducing property to exposure light). Therefore, it is possible to improve the positional relationship between the alignment mark and the light-shielding (light-reducing) pattern for integrated circuit pattern of the IP mask; and, in addition, it is also possible to recycle the IP mask. Note, for example, the second full paragraph on page 30 of Applicants' specification. Thus, it is possible to reduce the turn-around-time of the mask and the cost thereof.

Nishi discloses a producing method of a mask, in which an original or master plate is transferred onto a substrate such as a wafer in a lithography process. The producing method for the mask is described, for example, in a first aspect, at column 4, lines 25-43; and in a second aspect in the paragraph bridging columns 4 and 5. According to an eighth aspect, this patent discloses a producing method of a device including a step for transferring a device pattern (including a mask pattern, a pattern for

a semiconductor device, etc.) onto a workpiece using a projection exposure method. See column 8, lines 59-64. Note also column 4, lines 44-56. See also Fig. 1 and the description bridging columns 10 and 11 of Nishi.

Note also the last full paragraph in column 14, and the paragraph bridging columns 14 and 15, of Nishi, disclosing use of reticle alignment microscopes for detecting positions of alignment marks of the reticle. See also Fig. 16 and the corresponding description in connection therewith in column 25, lines 11-35, describing image processing type reticle alignment microscopes and alignment marks 242A and 242B on the master reticle RA.

While disclosing alignment marks on the master reticle, it is respectfully submitted that Nishi would have neither taught nor would have suggested the presently claimed method, including wherein, inter alia, alignment marks on the first photomasks (IP masks) are made of organic film having a light-shielding property or a light-reducing property to exposure light, and advantages thereof as discussed in the foregoing, and other features of the present invention as discussed in the foregoing and advantages thereof.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently in the application are respectfully requested.

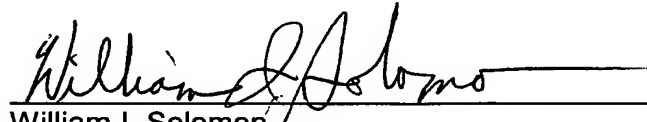
To the extent necessary, Applicants petition for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with the filing of

843.41042X00

this paper, including extension of time fees, to the Deposit Account No. 01-2135 (Case No. 843.41042X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

  
\_\_\_\_\_  
William I. Solomon  
Registration No. 28,565

1300 North 17<sup>th</sup> Street  
Suite 1800  
Arlington, VA 22209  
Tel: (703) 312-6600  
Fax : (703) 312-6666  
WIS:sjg